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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,926	12/09/2003	Jenn-Shing Wang		2423
7590	10/10/2006			
Far East College P.O. Box No. 6-57 Junghe Taipei, 235 TAIWAN				
			EXAMINER KEMMERLE III, RUSSELL J	
			ART UNIT 1731	PAPER NUMBER

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/729,926	<b>Applicant(s)</b> WANG ET AL.	
	<b>Examiner</b> Russell J. Kemmerle III	<b>Art Unit</b> 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities:

Page 5, lines 13-14, the energy required to degrease the pellets is said to not exceed 30%, but it is not clear as to what the 30% is of;

Page 10, line 6, in the brief description of Fig 4 the phrase "shows a" is unnecessarily repeated;

Page 11, lines 10-11 (and other places in the specification), reference is made to a "degreased half finished product" but it is not clear what this product is;

The specification appears to be a translation of a foreign document and contains many instances of improper grammar, most notably missing articles (such as "the" or "a"). It is recommended that the applicant or their representative reread the specification and correct wording or phrases that may have been improperly or incompletely translated into proper idiomatic English.

Appropriate correction is required.

### ***Claim Objections***

Claim 11 is objected to because of the following informalities:

The chemical formula for ferric oxide is given as " $\text{Fe}_2\text{O}_3 - \text{MeO}$ ". The correct chemical formula for ferric oxide is  $\text{Fe}_2\text{O}_3$ .

Appropriate correction is required.

Claim 13 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim from which it

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depends. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 13 is dependant on Claim 12. Claim 12 recites a claim where the dielectric material used to cover the ceramic pellet is a compound of ferric oxide and one of a list of other oxides. Claim 13 recites a claim where the dielectric material used to cover the ceramic is the same list of oxides recited in claim 12, used with or without the ferric oxide. For a dependant claim to be proper, it must contain all limitations of the claims from which it depends, and further limit the preceding claim. The removal of the requirement of ferric oxide from Claim 13 makes it broader than Claim 12 from which it depends, and therefore makes it improper.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2 and 3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 2 and 3 recite that the pellets be "directly heated to a sintering temperature", and then put into a sintering furnace (Claim 2), or directly utilize microwaves for sintering (Claim 3). The specification fails to teach how the pellets

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would be heated to a sintering temperature before being placed into a sintering furnace or before using microwaves to sinter the pellets.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the microwave dielectric powder" in step "(d)". There is insufficient antecedent basis for this limitation in the claim.

Regarding Claims 2 and 3, both recite that the pellets be "directly heated to a sintering temperature", and then put into a sintering furnace (Claim 2), or directly utilize microwaves for sintering (Claim 3). It is unclear how the pellets would be heated to a sintering temperature before being placed into a sintering furnace or before using microwaves to sinter the pellets.

Regarding claims 4-10, 12 and 13, the phrase "can be" renders the claim indefinite because it is unclear whether the limitation of the materials listed in those claims are positive limitations of the claimed invention. See MPEP § 2173.05(d).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Syte ('857) in view of Maeda ('277).

Van den Syte ('857) discloses a method of forming a ceramic green body by mixing ceramic particles or powder with a binder and shaping the mixture into a ceramic green body by any of a number of processes including injection molding, extrusion, or tape casting as examples (Col 1 lines 12-17). Van den Syte further discloses heating the resulting ceramic green body to drive out the binder (i.e., degreasing), and further heating the ceramic green body to sinter it (Col 1 lines 17-22).

Van den Syte ('857) does not disclose the method of heating the ceramic green body by covering it with a microwave susceptor material, subjecting the microwave susceptor material to microwave radiation, which causes the microwave susceptor material to heat up, and transfer heat to the ceramic green body.

Maeda ('277) discloses covering a ceramic green body with a microwave susceptor material and applying microwave radiation to the microwave susceptor material, which causes the microwave susceptor material to heat up, that heat is then transferred from the microwave susceptor material to the ceramic green body (Col 3 lines 16-35, Fig 6).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the method of heating a ceramic green body to remove the binder as taught by Van den Syte ('857) by changing the method of heating to that taught by Maeda ('277) of covering the ceramic green body with a microwave susceptor material and applying microwave radiation to the microwave susceptor material, causing

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the microwave susceptor material to heat up, and thus transferring the heat from the microwave susceptor material to the ceramic green body. This would have been obvious to one of ordinary skill in the art at the time of invention by applicant because Van den Syte ('857) discloses the method of removing the binder from a ceramic green body by heating the ceramic green body, and Maeda ('277) discloses that covering a ceramic green body with a microwave susceptor material and applying microwave radiation to the microwave susceptor material is an effective method of heating a ceramic green body.

Referring to Claim 2, Van den Syte ('857) in view of Maeda ('277) is relied upon as discussed above in the rejection of claim 1.

It is well known in the art to place a ceramic green body in a sintering furnace and raising the temperature of the ceramic green body in the furnace to the sintering temperature of that ceramic to sinter the ceramic green body.

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to have added to the method taught by Van den Syte ('857) in view of Maeda ('277) by sintering the ceramic green body after the binder had been removed since that is very well known in the art as a step in creating a finished ceramic piece.

Referring to Claim 3, Van den Syte ('857) in view of Maeda ('277) is relied upon as discussed above in the rejection of claim 1.

Van den Sype ('857) in view of Maeda ('277) as discussed in the rejection of claim 1 above does not teach the step of using microwave radiation to sinter the ceramic green body after removing the binder from it.

Maeda ('277) further teaches heating the microwave susceptor material by applying microwave radiation in a manner to cause the ceramic green body to heat up to a temperature sufficient to cause it to sinter (Col 3 lines 32-35).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to have added to the method taught by Van den Sype ('857) in view of Maeda ('277) as discussed above in Claim 1 by further heating the ceramic green body through heat transfer from the microwave susceptor material to a temperature sufficient to sinter the ceramic green body, since sintering a ceramic green body is well known in the art, and Maeda ('277) discloses that this can be achieved by applying microwave radiation to a microwave susceptor material covering the ceramic green body to be sintered.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Sype ('857) in view of Maeda ('277), in further view of Fathi ('114), Metcalf ('863), Hongo ('948), Fukushima ('893), and Chapman ('533).

Van den Sype ('857) in view of Maeda ('277) is relied upon as discussed above in the rejection of claim 1.

Maeda ('277) further discloses the use of metal oxides (specifically zirconia) as the microwave susceptor powder used to heat the ceramic green body (Col 3 lines 33-35).



Van den Sype ('857) in view of Maeda ('277) does not teach the use carbides, nitrides, titanates or sulfides as the microwave susceptor powder used to heat the ceramic green body.

Fathi ('114) discloses the use of carbides (specifically silicon carbide) as a microwave susceptor material (page 3 paragraph 0022).

Metcalf ('863) discloses the use of nitrides (specifically titanium nitride) as a microwave susceptor material (page 16 paragraph 0124).

Hongo ('948) also discloses the use of nitrides (specifically aluminum nitride) as a microwave susceptor material (page 8 paragraph 0097).

Fukushima ('893) discloses the use of titanates as a microwave susceptor material (Col 5 lines 6-12).

Chapman ('533) discloses the use of sulfides as a microwave susceptor material (page 4 paragraph 0083).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the method of heating a ceramic green body as taught by Van den Sype ('857) in view of Maeda ('277) as discussed in the rejection of Claim 1 above, by using a microwave susceptor material made of: an oxide (as further taught by Maeda ('277)), a carbide (as taught by Fathi ('114)), a nitride (as taught by Metcalf ('863)), a titanate (as taught by Fukushima ('893)), or a sulfide (as taught by Chapman ('533)). This would have been obvious to one of ordinary skill in the art at the time of invention by applicant because Van den Sype ('857) in view of Maeda ('277) as discussed above in Claim 1 teaches a method of heating a ceramic green body to

remove binders from the ceramic green body by covering the ceramic green body with a microwave susceptor material and subjecting that microwave susceptor material to microwave radiation, and materials that act as a microwave susceptor material are taught to include oxides, carbides, nitrides, titanates and sulfides as disclosed by Maeda ('277), Fathi ('114), Metcalf ('863) and Hongo ('948), Fukushima ('893), and Chapman ('533), respectively.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Sype ('857) in view of Maeda ('277), in further view of Fathi ('114).

Van den Sype ('857) in view of Maeda ('277) is relied upon as discussed above.

Van den Sype ('857) in view of Maeda ('277) fails to teach the use of a specific one of the listed carbides as the microwave susceptor material.

Fathi ('114) discloses the use of carbides (specifically silicon carbide) as a microwave susceptor material (page 3 paragraph 0022).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the method of heating a ceramic green body as taught by Van den Sype ('857) in view of Maeda ('277) as discussed in the rejection of Claim 1 above, by using a microwave susceptor material made of a carbide as taught by Fathi ('114), since Van den Sype ('857) in view of Maeda ('277) as discussed above in Claim 1 teaches a method of heating a ceramic green body to remove binders from the ceramic green body by covering the ceramic green body with a microwave susceptor material and subjecting that microwave susceptor material to microwave radiation, and Fathi ('114) discloses that carbides act as a microwave susceptor, suitable for use in

this application. The selection of a specific carbide would have been obvious over Van den Syde ('857) in view of Maeda ('277), in further view of Fathi ('114) since the selection of the specific carbide is simply a matter of choice or preference.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Syde ('857) in view of Maeda ('277), in further view of Metcalf ('863) and Hongo ('948).

Van den Syde ('857) in view of Maeda ('277) is relied upon as discussed above.

Van den Syde ('857) in view of Maeda ('277) fails to teach the use of a specific one of the listed nitrides as the microwave susceptor material.

Metcalf ('863) discloses the use of nitrides (specifically titanium nitride) as a microwave susceptor material (page 16 paragraph 0124).

Hongo ('948) discloses the use of nitrides (specifically aluminum nitride) as a microwave susceptor material (page 8 paragraph 0097).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the method of heating a ceramic green body as taught by Van den Syde ('857) in view of Maeda ('277) as discussed in the rejection of Claim 1 above, by using a microwave susceptor material made of a nitride as taught by Metcalf ('863) and Hongo ('948), since Van den Syde ('857) in view of Maeda ('277) as discussed above in Claim 1 teaches a method of heating a ceramic green body to remove binders from the ceramic green body by covering the ceramic green body with a microwave susceptor material and subjecting that microwave susceptor material to microwave radiation, and Metcalf ('863) and Hongo ('948) disclose that nitrides act as a microwave susceptor, suitable for use in this application. The selection of a specific

nitride would have been obvious over Van den Syne ('857) in view of Maeda ('277), in further view of Metcalf ('863) and Hongo ('948) since the selection of the specific nitride is simply a matter of choice or preference.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Syne ('857) in view of Maeda ('277), in further view of Fukushima ('893).

Van den Syne ('857) in view of Maeda ('277) is relied upon as discussed above.

Van den Syne ('857) in view of Maeda ('277) fails to teach the use of a specific one of the listed titanates as the microwave susceptor material.

Fukushima ('893) discloses the use of titanates as a microwave susceptor material (Col 5 lines 6-12).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the method of heating a ceramic green body as taught by Van den Syne ('857) in view of Maeda ('277) as discussed in the rejection of Claim 1 above, by using a microwave susceptor material made of a titanate as taught by Fukushima ('893), since Van den Syne ('857) in view of Maeda ('277) as discussed above in Claim 1 teaches a method of heating a ceramic green body to remove binders from the ceramic green body by covering the ceramic green body with a microwave susceptor material and subjecting that microwave susceptor material to microwave radiation, and Fukushima ('893) discloses that titanates act as a microwave susceptor, suitable for use in this application. The selection of a specific titanate would have been obvious over Van den Syne ('857) in view of Maeda ('277), in further view of Fukushima

('893) since the selection of the specific titanate is simply a matter of choice or preference.

Claims 8, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Syte ('857) in view of Maeda ('277), in further view of Young ('301).

Van den Syte ('857) in view of Maeda ('277) is relied upon as discussed above.

Van den Syte ('857) in view of Maeda ('277) fails to teach the use of a specific one of the listed oxides as the microwave susceptor material.

Young ('301) discloses the use of oxides as a microwave susceptor material (Claims 5 and 6).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the method of heating a ceramic green body as taught by Van den Syte ('857) in view of Maeda ('277) as discussed in the rejection of Claim 1 above, by using a microwave susceptor material made of an oxide as taught by Young ('301), since Van den Syte ('857) in view of Maeda ('277) as discussed above in Claim 1 teaches a method of heating a ceramic green body to remove binders from the ceramic green body by covering the ceramic green body with a microwave susceptor material and subjecting that microwave susceptor material to microwave radiation, and Young ('301) discloses that oxides act as a microwave susceptor, suitable for use in this application. The selection of a specific oxide would have been obvious over Van den Syte ('857) in view of Maeda ('277), in further view of Young ('301) since the selection of the specific oxide is simply a matter of choice or preference.

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Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Syde ('857) in view of Maeda ('277), in further view of Chapman ('533).

Van den Syde ('857) in view of Maeda ('277) is relied upon as discussed above.

Van den Syde ('857) in view of Maeda ('277) fails to teach the use of a specific one of the listed sulfides as the microwave susceptor material.

Chapman ('533) discloses the use of sulfides as a microwave susceptor material (page 4 paragraph 0083).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the method of heating a ceramic green body as taught by Van den Syde ('857) in view of Maeda ('277) as discussed in the rejection of Claim 1 above, by using a microwave susceptor material made of a sulfide as taught by Chapman ('533), since Van den Syde ('857) in view of Maeda ('277) as discussed above in Claim 1 teaches a method of heating a ceramic green body to remove binders from the ceramic green body by covering the ceramic green body with a microwave susceptor material and subjecting that microwave susceptor material to microwave radiation, and Chapman ('533) discloses that sulfides act as a microwave susceptor, suitable for use in this application. The selection of a specific sulfide would have been obvious over Van den Syde ('857) in view of Maeda ('277), in further view of Chapman ('533) since the selection of the specific sulfide is simply a matter of choice or preference.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Syde ('857) in view of Maeda ('277), in further view of Xu ('196).

Van den Sype ('857) in view of Maeda ('277) is relied upon as discussed above.

Van den Sype ('857) in view of Maeda ('277) fails to teach the use of ferric oxide as the microwave susceptor material.

Xu ('196) discloses the use of ferric oxide as a microwave susceptor material (Col 1 lines 24-28).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the method of heating a ceramic green body as taught by Van den Sype ('857) in view of Maeda ('277) as discussed in the rejection of Claim 1 above, by using a microwave susceptor material made of ferric oxide as taught by Xu ('196), since Van den Sype ('857) in view of Maeda ('277) as discussed above in Claim 1 teaches a method of heating a ceramic green body to remove binders from the ceramic green body by covering the ceramic green body with a microwave susceptor material and subjecting that microwave susceptor material to microwave radiation, and Xu ('196) discloses that ferric oxide acts as a microwave susceptor, suitable for use in this application.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Sype ('857) in view of Maeda ('277), in further view of Xu ('196) and Young ('301).

Van den Sype ('857) in view of Maeda ('277) is relied upon as discussed above.

Van den Sype ('857) in view of Maeda ('277) fails to teach the use of ferric oxide used in combination with another oxide as the microwave susceptor material.

Xu ('196) discloses the use of ferric oxide as a microwave susceptor material (Col 1 lines 24-28).

Young ('301) discloses the use of oxides as a microwave susceptor material (Claims 5 and 6).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the method of heating a ceramic green body as taught by Van den Syne ('857) in view of Maeda ('277) as discussed in the rejection of Claim 1 above, by using a microwave susceptor material made of ferric oxide as taught by Xu ('196) in combination with another oxide taught to work as a microwave susceptor material by Young ('301), since Van den Syne ('857) in view of Maeda ('277) as discussed above in Claim 1 teaches a method of heating a ceramic green body to remove binders from the ceramic green body by covering the ceramic green body with a microwave susceptor material and subjecting that microwave susceptor material to microwave radiation, and the combination of two materials known to act as a microwave susceptor material (ferric oxide as taught by Xu ('196) and another oxide as taught by Young ('301)) would have been obvious to one of ordinary skill in the art since both selections are known to act as a microwave susceptor material suitable for use in this application.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Holcombe ('578 and '130) and Apte ('092 and '282) all pertain to sintering using microwave radiation. Takayama ('379) and Adachi ('331) both pertain to heating of a ceramic green body to remove binders. Apte ('087), Katz ('325) and Dalton




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('840) all pertain heating by microwaving a microwave susceptor material around the piece to be heated.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell J. Kemmerle III whose telephone number is 571-272-6509. The examiner can normally be reached on Monday through Friday, 8:30-4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
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